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MISCELLANEOUS PUBLICATION No. 169

WASHINGTON, D.C. ★ MARCH 1934

DESCRIPTIONS OF TYPES OF PRINCIPAL AMERICAN VARIETIES OF CABBAGE

Prepared jointly by specialists of the United States Department of Agriculture and of the Agricultural Experiment Stations of California, Pennsylvania, South Carolina, Texas, Virginia, and Wisconsin

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Washington, D.C. March 1934

DESCRIPTIONS OF TYPES OF PRINCIPAL AMERICAN VARIETIES OF CABBAGE

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INTRODUCTION

This publication is the second of a series planned for issuance over a period of years relative to types of American varieties of vegetables. On account of a lack of any generally accepted, authentic, and adequate description of even the most important of vegetable varieties, there has been great disagreement and some confusion as to exactly what characteristics a certain variety should possess. Members of the seed trade who deal in vegetable seeds, as well as the farmers, canning-factory operators, and market gardeners, who buy vegetable seeds, have long desired and urgently requested that the United States Department of Agriculture undertake exhaustive studies and issue adequate descriptions of the most widely used varieties. The sustained interest, generous cooperation, and constructive criticisms of these agencies have greatly helped the Department and the cooperating State experiment stations in initiating this work and carrying it to its present stage of development. The authors of this publication gratefully acknowledge the assistance that has been given them.

HOW THESE TYPES AND DESCRIPTIONS WERE ESTABLISHED

This work is designed to present the consensus of opinion of the seedsmen, vegetable growers, and horticulturists in the United States who are most familiar with cabbage varieties as they are, and who are best qualified to judge what type should be established as a standard. Practical rather than theoretical considerations have been the basis of the procedure followed. The standard presented for each variety is not an imaginary ideal impossible of attainment, but is a representation based upon a stock actually in existence. It is true that no stock has been found, every plant and head of which will conform to the standard described; but it is possible to improve certain stocks that approach the ideal type until a satisfactorily high percentage of plants and heads are in close agreement with the standard.

Numerous conferences and discussions with representatives of the seed industry, market-gardeners' and truck-growers' organizations, as well as with Federal and State agricultural workers all over the country,

[1] The names of the joint authors who collaborated in the several States are listed according to the alphabetical order of the names of the cooperating institutions as a matter of convenience since it is not possible to list them in any order of rank or seniority. This publication represents the joint efforts of all the authors, aided by the criticisms and suggestions of the various agencies referred to herein. Although it is offered without apology, the authors recognize that it represents an entirely new and untried kind of service to growers and users of vegetable seeds and vegetable products.

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were held to determine the greatest needs that could be fulfilled by this "Vegetable variety standardization and description" work. What the various industries most desire at this time is a treatment of the few, well-established, important, and distinct varieties that constitute most of the acreage and value. It is conservatively estimated that the nine varieties of cabbage herein described include 85 or probably 90 percent of all the cabbage grown in the United States. It is generally agreed that a proper consideration of the scores of varieties of minor commercial importance but great horticultural and genetic interest would require vastly more time and greater resources than are now available; and, important as that problem is, for some time it must be considered secondary to a careful delimiting of the present dominant varieties.

After determining the list of varieties to be considered, groups of Federal and State workers jointly devised the methods of work. Several of the best available stocks of each of the different varieties were then obtained from numerous seed growers in this country and in Europe, through the generous assistance of the vegetable research committee of the American Seed Trade Association.

Twenty-two crops of cabbage were grown in eight widely separated States over a period of 3 years. Exactly the same stocks were available to all workers for the entire period. In order to avoid possible prejudice, stocks of a variety were identified only by number, and the sources were unknown. Methods of growing in various locations were identical, with certain exceptions that were necessary in the irrigated regions. All methods of observation, recording data, and description were uniform, according to a prearranged plan. Field trips to different States were made by the workers during or just before the harvest season, so as to observe and discuss variety types and variations in type caused by cultural conditions and climate. Winter conferences were held, where data and photographs were gathered together, and decisions were based upon results obtained all over the country. Tentative descriptions and illustrations were prepared in the fall of 1930, after 2 seasons' work, and sent to the vegetable research committee of the American Seed Trade Association and to all collaborators for criticism and comment. These criticisms were used in making certain corrections and in carefully verifying the descriptions in the field in the various locations in 1931.

DEVELOPMENT OF IMPROVED VARIETIES IS NEEDED

The describing in this publication of the few dominant varieties of cabbage must not be interpreted to mean that these varieties meet all possible requirements of the trade perfectly and that new and improved varieties are not needed. These definitions of the present most important varieties should in no way discourage the breeding of new and distinct sorts so long as the new kinds are really different and really better than those now existing. There is no merit in a new variety merely by virtue of its being different from others; it must meet specific requirements that other varieties cannot meet, if it is to deserve consideration. Furthermore, an improvement in yielding capacity alone, or in yield and uniformity of one of the present types is not justification for claiming that it is a new variety. Differences should be qualitative as well as quantitative and must be such that they can be clearly described and easily recognized.

WHAT THESE DESCRIPTIONS WILL ACCOMPLISH

It is hoped and generally believed that the publication of these descriptions will have several desirable results: (1) All stocks of seed of the varieties described can eventually be made to approach the established and generally recognized type, with the result that varieties can be ordered by name with confidence that the desired types will be obtained. (2) Thorough familiarity with the important varieties for which types have been established and adequately described will facilitate detection of misnamed and renamed stocks. (3) Familiarity of the buying public with the few really different and important varieties that are required to meet most general market- and home-garden demands should eliminate from present seed lists hundreds of names of so-called "varieties" which often are not distinctly different from, and rarely are superior to, good strains of established sorts. If growers learn the merits of the standard varieties and cease demanding the numerous things of minor importance it will be practicable for the seed grower to reduce the number of stocks that he must carry in order to meet buyers' demands. This in turn will simplify production and handling and will permit the seed grower to devote more attention to the chosen varieties, with a resultant improvement in commercial stocks.

It must be emphasized, however, that the attainment of these objectives is dependent upon the entirely voluntary action of all persons concerned. Growers and seedsmen have expressed their desire for such a definition of varieties as is here presented, in the belief that it would guide them in their informal, voluntary cooperative efforts to accomplish the unquestionably desirable ends outlined above.

EFFECTS OF ENVIRONMENT

Probably no one of our vegetable-crop plants is more subject to variation under different soil and climatic conditions than the cabbage. All descriptive terms and values presented here, unless otherwise stated, apply to the standard or type of the variety in question as it appears under most conditions where that variety is grown. Extreme variations in a character which result from obviously unfavorable environment were given little weight in establishing the limits of the standard type. Likewise, if a certain location or season produced unusually favorable results with reference to size, quality, yield, or other factors, and results that could not reasonably be expected year after year or in other regions, those results were considered not typical and so were given little weight. However, extremes of behavior were considered, and special mention is made of them when necessary, in order to fulfill the objects of this work.

TIME OF DEVELOPMENT

As the effects of temperature and moisture upon the rate of plant growth and development are generally recognized, it should be readily understood why in describing the standards of a variety, rather wide limits are allowed for its time of development in different regions.

SIZE AND SHAPE OF PLANT, HEAD, AND LEAVES

Typical plants can be expected only on lands fertile enough to produce normally profitable yields of the crop in question, and under conditions of management and weather that usually produce favorable results. Good judgment and a spirit of fairness must be used in considering such factors before a stock is condemned as being off type, or before a bad stock is defended on the ground of unfavorable environment.

Poor soil or drought obviously may result in sizes of entire plant, head, and leaves that are below those indicated for the ideal type. Excessive temperatures likewise retard the growth of cabbage. Sometimes the result is not only small size of plants but also a rather marked alteration in the proportions of different plant parts, which changes the appearance to such an extent as to make accurate identification very difficult if not impossible. This effect is found less commonly than variations in size but must be considered whenever a stock appears to be off type.

In arid regions, or during a drought, more of the outside leaves drop from the plant than when moisture is plentiful, and the stem therefore appears to be longer. Very hot weather also produces abnormally elongated stems. Conditions conducive to poor heading usually result in a proportionally greater leafiness although the leaves may be smaller.

Observations on single stocks grown in widely different regions show a tendency for heads grown in southern regions to be slightly greater in diameter in proportion to length or depth, than in the cooler Northern States. Although this difference is noticeable, it does not appear to be so great as to make impossible the development of a single stock which will reasonably conform to the type of the variety over a wide range of conditions. The allowable limits of variation set forth in the following descriptions are designed to include the slight unavoidable differences that exist between different regions.

There are also slight differences in direction of leaf growth between warm and cool regions. To the northward and at high altitudes, the outer leaves tend generally to be perceptibly more erect. This may be truly correlated with the slightly greater proportional depth or length of heads.

In very unfavorable environments the outer leaves tend to be shorter and more incurved or spoon-shaped, giving the plant a more rosettelike appearance than is typical for the variety. Close planting often tends to cause this, the leaf direction being somewhat different from that obtained when the plants are spaced so that the leaves of adjacent plants do not touch in the row. However, this behavior resulting from close planting is characteristic of good stocks as well as poor, and must not be confused with poor type. As this characteristic is also very common in certain off-type plants with poor heading qualities even under ideal growing conditions, special care must be exercised not to mistake the causes of such an appearance of the plant. In the mountain and Pacific coast regions the leaves of all varieties tend to be much more distinctly petioled than in the humid eastern part of the country (pl. 1).

COLOR

Marked plant-food deficiencies will result in off-type color of foliage. In general, nitrogen deficiency causes lighter greens than are typical for the several varieties, while serious potash or phosphorus shortage often results in a localized bronze tint of the leaves.

Low soil moisture and atmospheric humidity usually result in distinctly heavier bloom than occurs under humid conditions. It has been reported too that heavy applications of ammonium sulphate will sometimes be followed by a heavier bloom, although generally a rapid growth forced by high-nitrogen fertilizer results in lighter bloom and a deeper-green color.

IMPORTANT CONSIDERATIONS IN COMPARISONS OF CABBAGE STOCKS OR STRAINS WITH THE PUBLISHED STANDARDS

In addition to considering the points brought out in Effects of Environment, it is necessary to observe certain precautions in making comparisons between varieties or between a variety in the field and the description of the standard in the following pages.

Varieties to be compared must be grown under as nearly identical soil and cultural conditions as possible, especially if earliness and yield are important. Close comparisons should not be attempted between rows widely distant in the field unless duplicate or triplicate plantings are made.

All varieties must be planted at the same time and transplanted to the field on the same day if possible.

Plants for transplanting must be grown carefully so that all lots have an equal chance for making a strong, stocky growth. They should be transplanted, generally, when 3 to 5 inches tall.

In general, the plants should be given sufficient space in the field so that the leaves of adjacent plants will not overlap in the row.

Although distinguishing characteristics are evident in most varieties long before the heads form, there is little need in emphasizing them here. Probably the most suitable time for noting the characteristics of a stock is as soon as a majority of the plants have produced heads ready for harvest.

The time of appearance of the first "hard" head in a stock is not a good indication of earliness. Earliness should be based on the time required for at least half of the plants to attain the harvest stage.

Plants reaching harvest stage very much earlier or later than the time when 50 percent or more of the heads are ready to cut cannot be considered truly representative of the strain even though the leaf habit, color, head shape, and certain other characters may appear typical. They are off type with respect to "season," at least, and frequently will be found divergent from type in other respects.

A stock cannot be fairly judged or always properly identified by observing just a few plants. If it contains a small proportion of mixtures or off-type plants these should not be included in the characterization of the type of the strain, but the presence of the mixtures should be noted. If a strain is obviously badly mixed or extremely variable in type, an attempt at its characterization is of little or no value. From strains uniform enough for description at least 30 to 40 representative plants should be chosen as a basis for characterization or comparison.

The observing and recording of colors is especially difficult, without the use of color standards which are designed for this purpose. Printed or painted standards in book form can be used with a degree of success.

In matching the colors of leaves with the small colored areas of the standard, great care must be taken. A piece of the object should be held as closely to the surface of the standard as possible, with precautions against marring or soiling the standard. The surfaces of the object and the standard must be parallel to each other and illuminated by daylight, preferably on a clear day, but not by the direct rays of the sun. If these comparisons are made indoors, light from a north window is best. The surfaces of the object and standard should be held so that the uninterrupted light of the sky strikes them at an angle of 40° to 50°.

Satisfactory color comparisons cannot be made by memory. Furthermore, the apparent color of an object depends largely on the background against which it is observed, as well as on the light falling upon it. The shape of an object, surface irregularities, shadows, and even the area of the colored surface observed contribute to the impression of color. Careful reference to a known standard is the only practicable way of obtaining a record of color in the field.

In observing large masses of color in the field the observer should stand facing as nearly directly away from the sun as possible.

The numerical designations of color values appearing in this publication are those used in A Dictionary of Color.[2]

The principal characteristics of the varieties of cabbage described in this publication are given in table 1.

[2] Maerz, A. J., and Paul, M. R. A dictionary of color. 207 p., illus. New York. 1930.

TABLE 1.—*Outstanding characteristics of the principal varieties of cabbage*

Item	Early Jersey Wakefield	Copenhagen Market	Charleston Wakefield	Early Winnigstadt	Glory of Enkhuizen	All Seasons	Late Flat Dutch	Danish Ballhead	Wisconsin Hollander
Chief use	Market and shipping.	Market and shipping.	Market and shipping.	Market and shipping.	Market and sauerkraut.	Market and sauerkraut.	Market and sauerkraut.	Market and storage.	Market and storage.
Season	First early	Medium early	Second early	Early mid-season.	Early mid-season.	Midseason	Late midseason.	Late	Late.
Time from transplanting to harvest (days).	65–70	68–73	75–80	80–90	85–90	90–95	100–105	105–120	110–120.
Plant size	Small	Medium	Large medium.	Large	Large	Very large	Very large	Large	Very large.
Leaf size	do	do	Large	Very large	do	do	Large	do	Do.
Leaf base	Wedge	Wedge		Petioled	Wedge	Spatulate or petioled.	Spatulate or petioled.	Wedge	Wedge.
Leaf tip	Broad	Broad		Narrow	Broad	Broad	Broad	Broad	Broad.
Leaf margin	Nearly flat	Nearly flat		Very wavy	Slightly wavy	Slightly wavy	Wavy	Nearly flat	Slightly wavy.
Leaf surface	Smooth	Very slightly undulate	Slightly undulate	Coarsely undulate	Slightly undulate	Slightly undulate	Undulate	Very slightly undulate	Distinctly undulate.
Bloom	Very light	Light medium.	Medium	Heavy	Medium heavy.	Heavy	Heavy	Very heavy	Very heavy.
Leaf color (upper side).	Dark green	Medium gray-green.		Greenish gray	Gray-green	Light gray-green.	Light gray-green.	Silver gray	Silver gray.
Plant habit	Semierect	Cup-shaped	Tall and spreading.	Spreading	Cup-shaped	Spreading	Spreading	Erect	Tall and spreading.
Plant stem	Short	Short	Short	Medium tall	Short	Medium	Large	Tall	Very tall.
Head size (pounds)	1¾–2¼	3–4	3–4	2½–3	5–6	5½–7	6½–8	5–6	5–6.
Head shape	Pointed	Globular	Pointed	Pointed	Globular	Deep flattened.	Flattened	Nearly globular.	Nearly globular.
Head firmness	Medium	Hard	Medium	Very hard	Hard	Hard	Hard	Very hard	Very hard.
Core diameter	Small	Medium	do	Large	Medium	Medium	Large	Large	Large.
Core length	Medium	do	do	Short	do	Medium long	Medium long	Medium long	Long.

EARLY JERSEY WAKEFIELD

BRIEF CHARACTERIZATION

Grown for home and market garden and for early shipping.

Early; plant and leaves small; leaves few, rarely petioled, widely separated in arrangement, smooth, dark green, bloom slight, veins inconspicuous. Stem small and short, internodes very short.

Head pointed, small, 1¾ to 2¼ pounds, constituting about 60 percent of total plant weight. Length 6½ to 7¼ inches, diameter 4½ to 5 inches, or 70 percent of length; cross section circular. Top of head pointed, firm but not hard; middle of head fairly hard; head tends to burst soon after becoming hard. Interior rather loose or open, leaves much crumpled; core small, length about 43 percent of the head.

ADAPTABILITY AND USE

A short-season variety particularly adapted in the South to overwintering in the field when small. It is very sensitive to heat and does not thrive unless planted early, or grown in regions of cool summers. The demand for this variety in spring markets is heavy, but the superior yields and market qualities of other varieties, particularly Copenhagen Market, are causing keen competition with it. The variety is suited to home garden as well as commercial culture for early market and shipping.

SEASON

The earliest of important commercial varieties. Reaches harvest 65 to 70 days after transplanting in the spring. In warm regions and seasons develops as early as 60 days, but in more northern States and long cool spring seasons may require 75 days or longer.

PLANT

(Pls. 2 and 3)

Small; 1,350 to 1,600 g (3 to 3½ pounds) in weight, 25 to 30 cm (10 to 12 inches) in height, with maximum spread of 50 to 56 cm (20 to 22 inches), or approximately two times the height.

LEAVES

Few in number, typically 11 to 13, but varying under different soil and climate from 9 to 14. Leaves constitute 30 to 40 percent of weight of entire plant. Conditions conducive to heavy growth produce larger number of leaves. Excessive leafiness usually correlated with small heads; is undesirable.

Direction of outermost leaves slightly above horizontal with next inner leaves at angle about 45°. Bases of leaves near head curve closely to base of head, then stand nearly vertical with tips bent slightly outward or backward. Each leaf forms angle with axis of plant markedly different from almost every other leaf, giving entire plant exaggerated appearance of sparseness of leaves.

Along midrib of outermost leaves is a characteristic hump or upward bulge when viewed from above. Middle and terminal portions of outer leaves nearly flat across but bend slightly outward or downward from midrib.

Leaves nearly smooth, very slightly undulate; margins of outer leaves nearly flat and inner leaves slightly undulate; edges of outer leaves entire to just perceptibly crenate; inner leaves slightly crenate. Terminal portions of all leaves well rounded, basal portions of outer leaves broadly wedge-shaped except under western irrigation conditions, where they tend to be spatulate and even distinctly petioled; inner leaves rounded at base, entire leaf being practically circular in outline. Ribs thick but well colored and covered with bloom (upper side, 20 F 4; lower, 19 B 4 [3]), therefore not conspicuous. Veins inconspicuous with reference to both height and color (20 J 2). Bloom slight with resultant dark-green color of foliage (upper side, 23 A 5; lower, 28 B 3).

STEM

Small and short, about 2.5 cm (1 inch) in diameter and 2.5 to 4.0 cm (1 to 1½ inches) from soil surface to first leaves. Under arid or other conditions causing dropping of many of the outermost leaves, apparent height as much as 2 to 3 inches. Internodes very short, leaves very close together at attachment to stem. Base of head about 7 to 8 cm above soil (2¾ to 3 inches).

HEAD

Pointed, small, typically 800 to 1,000 g (1¾ to 2¼ pounds) constituting 55 to 65 percent of total weight of plant; under varying environment size varies greatly but should be no less than 700 g nor more than

[3] References are to plate, column, and row; for example, 20 F 4 refers to plate 20, column F, row 4 in A Dictionary of Color.



East



Middle West



West



Pacific Coast

Outermost Leaves



East



Middle West



West



Pacific Coast

Inner Leaves

Early Jersey Wakefield



East



Middle West



West



Pacific Coast

Outermost Leaves



East



Middle West



West



Pacific Coast

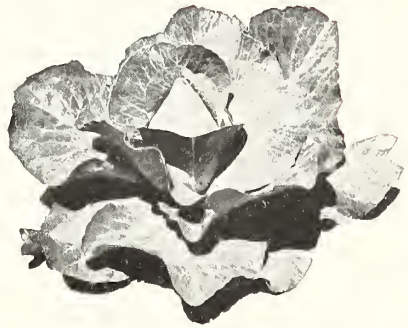
Inner Leaves

Copenhagen Market

Outer and inner leaves of cabbage varieties grown in different regions.



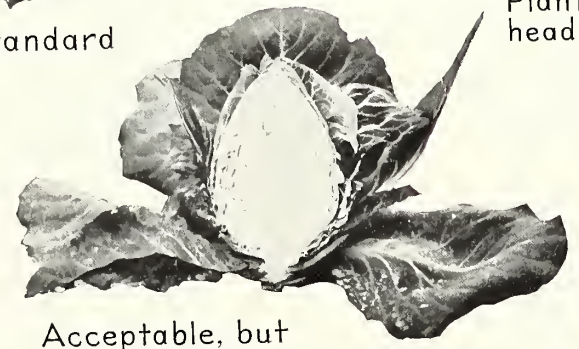
Standard



Acceptable.
Plant rather leafy and
head rather broad



Acceptable



Acceptable, but
rather coarse



Standard



Standard



Acceptable, but
point rather blunt
and base broad



Acceptable, but
base rather long



Standard



Short core desirable,
but better than is
typical

Early Jersey Wakefield

Standard and acceptable types.



L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

Early Jersey Wakefield, showing typical form and color

1,150 g (1 ½ to 2½ pounds). Measures 16.5 to 18.5 cm (6½ to 7¾ inches) long by 11.5 to 12.7 cm (4½ to 5 inches) greatest diameter, the diameter being 68 to 72 percent of the length. Circular in cross section. Top pointed, firm enough to pack and handle well; yields to pressure but cannot be broken or penetrated by pressure of the fingers. Base hemispherical and hard. Upon cutting head lengthwise, top moderately soft, but base yields very slightly to strong pressure.

Outermost leaves of head reach well past top (about 2.5 cm), extend well around circumference, and are held tightly against leaves beneath. Removal of outer head leaves difficult without tearing them. Midribs prominent in size but inconspicuous in color. Veins small and inconspicuous but more evident than in outer leaves covered with bloom. Loose head leaves yellow-green, bloom very slight (about 19 G 6). Outside of closely trimmed head greenish yellow (about 19 K 4).

Interior head structure appears loose and open. Inner leaves much crumpled. Midribs arise from main stem or core at angle of about 45°. Core small, 2.5 to 4.0 cm (1 to 1½ inches) in diameter at middle and 7.5 to 8.5 cm (3 to 3¼ inches) long, 40 to 45 percent of head length.

Texture tender and crisp under favorable conditions. Flavor fair to good but becomes very strong in warm weather.

HISTORY

One of the earlier accounts of Early Jersey Wakefield [4] states that the variety was first grown in the United States about 1840 by Francis Brill, of Jersey City, N.J. It was obtained from England under the name that it still carries. It has been listed by a number of seed firms in this country since about 1870.

[4] BRILL, F. FARM-GARDENING AND SEED-GROWING. pp. 63-64. New York. 1872.

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COPENHAGEN MARKET

BRIEF CHARACTERIZATION

Grown for home and market garden and for early shipping; used for sauerkraut in some mountain and extreme northern regions.

Early; plant and leaves medium size; leaves medium in number, bases wedge-shaped, rarely petioled; appear round, concave, curved upward toward head, but standing well away from head; tips of leaves just above top of head. Surface slightly undulate, margins nearly smooth; veins light, conspicuous; bloom medium, leaf color medium gray-green. Stem small and short, internodes very short.

Head apparently spherical, medium size, 3 to 4 pounds, constituting about 63 percent of total plant weight. Diameter 6 to 7 inches, length 5¾ to 6¾ inches; cross section circular. Head hard; interior fairly compact, but leaves crumpled. Core medium, length about 55 percent of the head.

NOTE: The standard here established for this variety resembles closely that strain recently known as Golden Acre. The larger, later types, which also have been called Copenhagen Market, are believed to be a marked deviation from the original idea of the variety. Since these strains are more like Glory of Enkhuizen than Copenhagen Market, there is little justification for describing any of them as a form of Copenhagen Market. Unless there is some great advantage to be gained and there is real need for establishing more than one type of a single named variety, it should be strongly discouraged, because it is very confusing.

ADAPTABILITY AND USE

This is a short-season variety especially valuable for early spring planting. It is not adapted to wintering over when small in the field because it lacks hardiness, is susceptible to winter injury, and has a strong tendency to shoot to seed in the spring if it survives the winter. It is satisfactory as a winter crop in the lower South where low temperatures are infrequent. As an early home-garden and market crop in the Middle and Northern States it is especially good, but it is not adapted to summer culture except at high altitudes or in the more Northern States, where summer temperatures are mild.

Widely grown for early market and shipping in the southern half of the country; a midseason market and shipper in intermediate sections and in the North; popular as a sauerkraut cabbage in extremely northern areas and certain irrigated regions.

SEASON

Early; reaches harvest 68 to 73 days after transplanting. In warm regions and seasons develops as early as 65 days. In Northern States and cool seasons it may require as much as 80 days. Often reaches harvest as early as Early Jersey Wakefield.

PLANT

(Pls. 4 and 5)

Medium size, typically 2,300 to 2,700 g (5 to 6 pounds), but varying from 2,000 to 3,000 g (4½ to 6½ pounds); under extremes of environment 21 to 29 cm (8½ to 11½ inches) in height, with maximum spread of 55 to 65 cm (22 to 25 inches), approximately 2.2 times the height.

LEAVES

Medium number, typically 14 to 16; but under extremes of environment ranging from 13 to 18. Leaves constitute 28 to 35 percent of weight of entire plant. Excessive leafiness often correlated with small heads and later maturity; is undesirable.

Direction of outermost leaves slightly above horizontal, with bases of next inner leaves extending horizontally from stem, then curving broadly or gradually upward so that terminal halves of leaves form an angle of about 45°. Bases of leaves near the head curve broadly upward, becoming almost erect but standing well away from the head. All leaves except outermost, distinctly and rather uniformly curved both along and across midrib, being shaped somewhat like the bowl of a rounded spoon. Tips of most of leaves stand at very nearly the same level above the ground and slightly above the top of the head, giving the plant a characteristic neat, well-trimmed appearance.

Leaf surface slightly undulate; margins of outermost leaves very slightly undulate and margins of inner leaves undulate; leaf edges of outer leaves slightly crenate and inner leaves crenate; terminal portions of leaves broadly rounded; bases of outer leaves wedge-shaped, bases of inner leaves broadly wedge-shaped, except under certain western irrigation conditions, where the inner leaves tend to be narrowly wedge-shaped and the outer leaves petioled.



L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

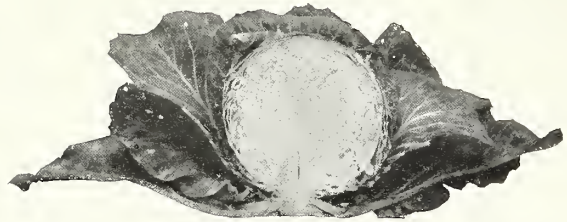
Copenhagen Market, showing typical form and color



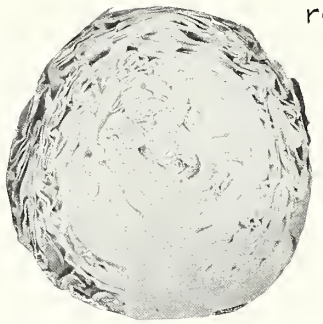
Standard



Acceptable, but leaves rather too spreading



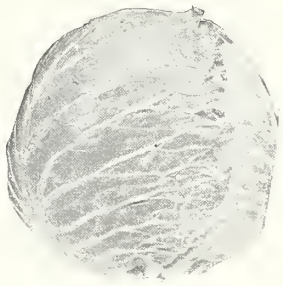
Standard



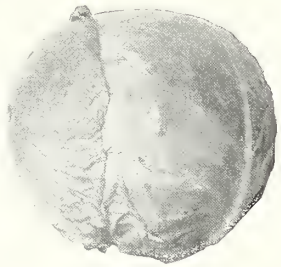
Standard



Short core very desirable, but better than is typical



Acceptable, but deeper than is typical



Standard



Standard

Copenhagen Market

Standard and acceptable types.

Ribs medium thick and conspicuous because of light color (19 H 1). Veins medium thick and quite conspicuous because of light color (19 H 1).

Bloom medium but not heavy enough to prevent light-colored veins showing conspicuously. Foliage appears a medium gray-green (22 B 7 to 22 E 7).

STEM

Small and short, about 2.5 cm (1 inch) in diameter and 2.5 to 4.0 cm (1 to 1½ inches) from soil surface to first leaves. Under arid or other conditions causing dropping of many of the outermost leaves, apparent height as much as 2 to 3 inches. Internodes very short, leaves very close at attachment to stem. Base of head about 7 to 8 cm above soil.

HEAD

Apparently spherical; medium size, typically 1,350 to 1,800 g (3 to 4 pounds) constituting 60 to 65 percent of total weight of plant; under differing environment size varies greatly but should be no less than 1,250 nor more than 2,250 g (2¾ to 5 pounds) except for uses (for example, sauerkraut making) in which there is no discrimination against large size. In certain western regions very close planting is necessary to avoid excessive size of head in stocks which do not grow undesirably large in most places. Measures 15 to 18 cm (6 to 7 inches) in equatorial diameter and 14.5 to 17 cm (5¾ to 6¾ inches) in depth, appearing to the eye to be perfectly spherical, but in fact very slightly flattened. During very hot and dry seasons heads sometimes slightly deeper than wide. Circular in cross section except for barely perceptible depressions at midribs of outermost leaves. Top and base hard, retaining solidity very well when head is cut lengthwise.

Outermost leaves of head reach just past center. Under drought and high temperature head leaves tend to be somewhat shorter, in extreme cases leaves of some heads not reaching the center. Outermost leaves lie closely against leaves beneath but are rather loosely held and easily removed. Midribs prominent in height but inconspicuous with reference to color (19 H 1). Smaller ribs and veins prominent. Head leaves light yellow-green in marked contrast to loose outer leaves of plant (about 19 J 6 near top of head and 19 I 3 near base). Bloom slight.

Interior head structure appears medium compact. Outer leaves, particularly over top of head, smooth or slightly crumpled. Most of interior leaves much crumpled but lie closely together forming hard head. Midribs arise from stem or core at angle about 40° with the horizontal. Core medium, 3 to 4 cm (1¼ to 1½ inches) in diameter at middle and 7.5 to 9.0 cm (3 to 3½ inches) long, 53 to 58 percent of axial diameter of head.

Texture tender and crisp under favorable conditions. Flavor very good.

HISTORY

Copenhagen Market was produced by Hjalmar Hartmann & Co., of Copenhagen, Denmark, and first introduced in 1909. The originators have stated that "it is the result of a selection from one single characteristic individual that turned up among other samples in our trial grounds." Thus the exact identity of the parent stock apparently is not known, but it is believed by some to be the old German variety, Ditmarscher. The variety was introduced into the United States and first listed by W. Atlee Burpee & Co., of Philadelphia, Pa., in 1911.

EARLY WINNIGSTADT

BRIEF CHARACTERIZATION

Grown chiefly in the fall and winter for early spring harvest and shipping in Pacific Coast States.

Early midseason when planted in the spring; plant and leaves large; leaves medium number, widely separated in arrangement, bases usually distinctly petioled and ends appear somewhat pointed; margins quite wavy, giving rosette appearance about the head; ribs and veins prominent; bloom heavy, leaf color distinctly greenish gray on upper surface, bluish gray on under surface. Stem medium size, medium long; internodes long.

Head broad based but pointed; small to medium size, 2½ to 3 pounds but sometimes 4 to 5 pounds, constituting about 40 percent of the total plant weight. Length 6¾ to 7½ inches; diameter 5 to 5½ inches, or about 75 percent of the length; cross section slightly oblong. Top of head small pointed, tips of outer head leaves generally forming tuft about point. Head very hard, interior very compact. Core short but very broad, conic; length about 37 percent of the head.

ADAPTABILITY AND USE

Early Winnigstadt is grown chiefly in California as a late-fall or winter crop, maturing in the winter or very early in the spring. It appears, however, to have possibilities of merit as a winter and early-spring shipper to be grown in the South Atlantic and Gulf States. It is apparently somewhat more resistant to unfavorable climatic conditions than most varieties and will stand in the field an unusually long time after the heads become hard, without bursting.

This variety does not appear to be of special merit in the more northern States, since others that will produce a greater tonnage are more in demand at the season it could be grown. It is not used for storing or for sauerkraut.

SEASON

When transplanted in early spring, is ready for harvest early midseason, about 80 to 90 days later. In regions of early warm weather after short cool spring may develop in 75 to 80 days. Will stand longer, after becoming firm without bursting, than other commercial varieties.

PLANT

(Pls. 6, 7, and 8)

Medium large in size with reference to weight but may be called large with reference to height and spread of leaves. Weighs 2,500 to 3,200 g (5½ to 7 pounds), is 33 to 38 cm (13 to 15 inches) in height with maximum spread of 70 to 85 cm (28 to 34 inches), approximately 2.2 times the height.

LEAVES

Medium number, typically 14 to 16, rarely less than 14 but often 17 or 18 under conditions conducive to heavy growth. Constitute 45 to 50 percent of weight of entire plant, a rather high proportion of leaves. In humid eastern regions axillary buds enlarge to a very marked extent, forming numerous miniature heads.

General direction of outermost leaves horizontal to slightly drooping because of great length; the terminal portions may turn upward slightly. Next inner leaves extend stiffly from stem at about 45°; intermediate leaves at angle about 60° to 70° and those clasping base of head, erect and bending or flaring outward near tip. Midribs nearly straight; very little curvature except in leaves clasping head. Lateral halves of leaves frequently stand at distinct angle upward from midrib.

Leaf surfaces coarsely undulate; margins distinctly undulate or broadly wavy; edges slightly crenate. Leaf blades of outermost leaves distinctly longer than broad, terminal portions sharply rounded, and almost always distinctly petioled at base; intermediate and inner leaves nearly circular in outline when laid flat, except leaves from plants grown under arid western conditions, which retain the petioled or spatulate character. Terminal portion of inner leaves well rounded and base showing short, broad, wedge shape. Ribs and veins prominent in height, also much lighter in color than other parts of leaf, this marked difference in color being masked somewhat by heavy bloom. Heavy bloom gives upper surface of outer leaves distinctly greenish gray (about 30 C 3 to 31 C 3) appearance while lower surface is bluish gray.

STEM

Medium in thickness, about 3.2 to 3.8 cm (1¼ to 1½ inches), and short, 2.5 to 4.0 cm (1 to 1½ inches) from soil surface to first leaves. Under arid or other condi-



Acceptable, but lacking vigorous leaf growth



Standard



Acceptable, but head rather small



Acceptable, but lacking vigorous leaf growth



Standard

Early Winnigstadt

Standard and acceptable types of plant



Standard



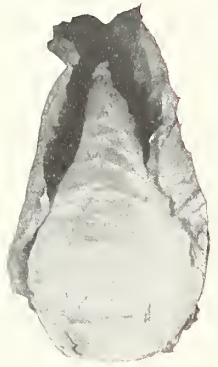
Acceptable.
Leaf tuft lacking



Standard.
Showing wrapper leaf



Acceptable.
Rather thick
near top



Point too long
and slender



Outermost leaf.
Grown in the East



Standard



Acceptable.
Core rather large.
Compactness excellent



Standard



An inner leaf.
Grown in the East

Early Winnigstadt

Types of heads and outer and inner leaves.



L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

Early Winnigstadt, showing typical form and color

tions causing dropping of leaves, apparent height as much as 2 to 3 inches. Stem medium long, 7.5 to 10.0 cm (3 to 4 inches) from first leaf to head; internodes long with leaves widely spaced, with base of head thus 10 to 14 cm (4 to 5½ inches) above the soil.

HEAD

Broad based but pointed; small to medium size, typically 1,150 to 1,350 g (2½ to 3 pounds) although under especially favorable conditions may weigh over 2,000 g (4½ pounds). Constitutes 35 to 45 percent of total plant weight, a distinctly lower proportion than that of leaves, and a lower proportion of head size to plant size than shown by other commercial varieties. Measures 17 to 19 cm (6¾ to 7½ inches) long by 12.5 to 14.5 cm (5 to 5¾ inches) in diameter, the diameter being 70 to 75 percent of the length. Slightly oblong in cross section. Top pointed but well filled and firm. Base slightly elongate-rounded, very hard. Upon heads being cut lengthwise, base remains hard, and top loses firmness but very slightly because of very close, compact internal leaf arrangement.

Outermost leaves of head extend around circumference, about two thirds, sometimes almost completely, an unusual extent, and are held very closely and tightly to leaves beneath. Outermost leaves extend above point of head and curve outward, forming characteristic leafy tuft or tip. Leaves covering point rather short, extending just past center. Ribs and veins medium size, medium conspicuous with reference to color. Outer head leaves nearly same color as outer plant leaves; medium (about 30 D 7) bloom. Next inner head leaves lighter (about 22 G 7).

Interior structure very compact. Leaves crumpled to moderate degree but deep within head compressed so tightly as to be indistinct. Midribs arise from main stem or core rather erectly, at angle 55° to 60° with the horizontal. Core thick and short, conic in shape; 3.8 to 5 cm (1½ to 2 inches) in diameter at base, and 6.5 to 7.5 cm (2½ to 3 inches) long, 35 to 40 percent of head length.

Texture tender and crisp under wide range of conditions. Flavor very good.

HISTORY

Early Winnigstadt is an old German variety of unknown origin and bears the name of the town in Germany where it first became well known. It was listed in the United States as early as 1866 by J. J. H. Gregory & Son, Marblehead, Mass., and by D. M. Ferry & Co., of Detroit, Mich., in 1868.

181494°—34——3

GLORY OF ENKHUIZEN

BRIEF CHARACTERIZATION

Grown for midseason market, shipping, and sauerkraut.

Early midseason; plant and leaves large; leaves numerous, but constitute only about 30 percent of total plant weight; leaf bases wedge-shaped, rarely petioled; generally appear round, concave, curved upward toward and extending slightly above top of head. Surface very slightly blistered, margins slightly undulate; ribs and veins conspicuous; bloom medium heavy, leaf color gray-green. Stem small and short, internodes short.

Head apparently spherical, large, 5 to 6 pounds, constituting about 68 percent of total plant weight. Diameter 7¼ to 8 inches, depth 6¾ to 7½ inches; cross section circular. Head hard, interior leaves crumpled but compact. Core medium, length about 45 percent of head.

ADAPTABILITY AND USE

Range of successful culture probably less extensive than Copenhagen Market, which it resembles in appearance. On account of the medium-long growing season it requires, it is not best suited to regions where hot summer temperatures occur early. In regions of temperatures low for plant growth (as during winter in the South) Glory of Enkhuizen develops too slowly and is too late to be as profitable as certain other varieties. It is well adapted as a midseason crop in the northern half of the country, or at altitudes where only mild daily mean temperatures occur.

Grown for midseason market, shipping, and sauerkraut.

SEASON

An early midseason variety. Commonly reaches harvest 85 to 90 days after being transplanted in late spring or early summer but this period varies considerably because of wide latitude existing in planting and transplanting dates, which even in one locality afford markedly different climatic conditions under which plants make much of their growth. May mature in as few as 75 or in cool weather require as many as 100 days.

PLANT

(Pls. 9 and 10)

Large; typically 3,600 to 4,500 g (8 to 10 pounds) in weight, 28 to 30 cm (11 to 12 inches) in height, and spreading 60 to 70 cm (24 to 28 inches), approximately 2.2 times the height.

LEAVES

Many; 17 to 20, constituting but 27 to 32 percent of weight of entire plant. Leaves are large, but low percentage of entire plant weight is result of large heavy head rather than of small leaves.

Two outermost whorls of leaves extend outward at angle slightly above horizontal, next inner leaves at angle 45° to 50° with horizontal, but standing well away from head, leaving head prominently exposed. The leaves extend but slightly above top of head.

Leaf surfaces very slightly blistered, margins very slightly undulate, edges medium crenate. Leaves slightly concave along midrib, curving outward slightly near distal end; concave across midrib, slight curvature toward head but standing well away from head. Bases of outermost leaves narrowly wedge-shaped or wedge-shaped; petioled in arid regions; bases of inner leaves wedge-shaped, distal portions broadly rounded. In the East and South the leaves in general have a roundish shape, but in arid western regions the leaves are definitely elongated.

Ribs prominent in height, conspicuous in color (about 18 C 3). Veins conspicuous (about 18 C 3), except when covered by fairly heavy bloom in regions of low humidity.

Bloom medium heavy, masking medium green of leaves to only moderate extent, giving gray-green color (about 23 K 7), but not masking light-colored ribs (about 18 C 3).

STEM

Small and short; about 3.3 cm (1¼ inches) in diameter and 2.5 to 3.3 cm (1 to 1¼ inches) from soil to first leaf. Stem appears taller if many leaves have dropped. Internodes short, leaves crowded at attachment to stem. Base of head 7 to 8 cm (2¾ to 3¼ inches) above soil.

HEAD

Apparently spherical; large; typically 2,300 to 2,700 g (5 to 6 pounds) constituting 65 to 70 percent of the entire plant weight, an unusually high proportion. Head size varies widely, but good type should be no smaller than 2,000 nor larger than 3,000 g (4½ to 6½ pounds) for market purposes. Very large heads of 10 to 12 pounds are sometimes grown; this is too large for market, but not objectionable for sauerkraut.



Standard



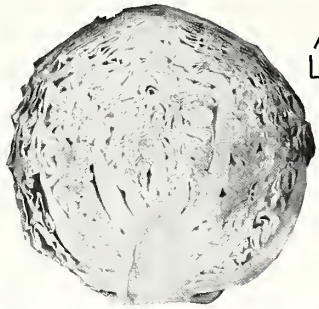
Standard



Acceptable. Leaves rather off type



Acceptable. Core rather long



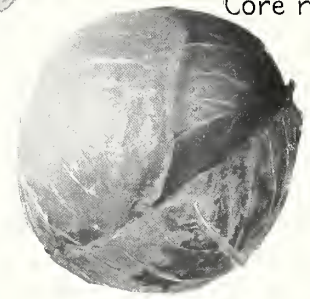
Short core very desirable, but better than is typical



Standard



Standard



Standard



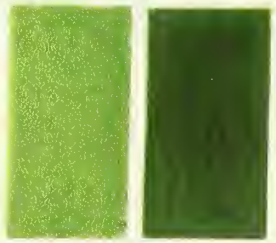
Acceptable. Small point at top not uncommon



Acceptable, but rather deep

Glory of Enkhuizen

Standard and acceptable types.





L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

Glory of Enkhuizen, showing typical form and color

Typical head measures 18 to 20 cm (7 to 8 inches) in equatorial diameter and 17.0 to 18.5 cm (6¾ to 7¼ inches) in polar diameter or depth. Depth is 90 to 95 percent of the diameter. Round in cross section. Top and base very hard, retaining solidity well when head is cut vertically.

Outer leaves reach slightly past center of head and hardly more than half way around circumference; lie tightly against underlying leaves.

Ribs and veins very prominent in height. Ribs not conspicuous, light in color (about 18 C 3), bloom light. Head color yellowish green (about 20 J 6), in medium contrast to leaf color.

Interior head structure appears medium compact. Outer leaves, particularly over top of head, smooth or slightly crumpled. Interior leaves slightly crumpled, lying very closely together forming hard head. Core medium, 3 to 4 cm (1¼ to 1½ inches) in diameter and 7.5 to 9 cm (3 to 3½ inches) long, 40 to 50 percent of polar diameter.

Texture tender and crisp under favorable conditions. Flavor good. Quality generally very good.

HISTORY

Glory of Enkhuizen was originated by N. V. Sluis en Groot's Koninklijke Zaadteelt en Zaadhandel, of Enkhuizen, Netherlands. According to the originators it "* * * was selected originally from the old German variety Glückstadter, however, with the idea of combining the good qualities of this strain with those of another old German strain: Ditmarscher, * * *." This original selection was made at Enkhuizen in 1899, and seed was offered to both European and American trade in 1902. The first seed of the variety for sale in this country was offered by J. C. Vaughan's Seed Store, Chicago, Ill., in 1903.

ALL SEASONS

BRIEF CHARACTERIZATION

Grown for midseason or main crop for market or sauerkraut.

Midseason; plant and leaves very large; of open, spreading appearance; leaves numerous, bases spatulate to petioled; blades nearly round, curved upward slightly; leaves near head erect, standing well above top of head. Surfaces and margins slightly undulate, edges medium crenate. Ribs and veins prominent, bloom heavy; leaf color light gray-green. Stem and internodes medium.

Head oblate, or deep but somewhat flattened; large, 5½ to 7 pounds, constituting about 60 percent of total plant weight. Diameter 8½ to 9½ inches, depth 6 to 6½ inches, about 70 percent of the diameter; top of head slightly rounded, cross section rather angular. Head hard; interior leaves in top of head smooth and very compact; in sides of head crumpled and compact; core medium, length about 60 percent of head.

ADAPTABILITY AND USE

A good midseason variety in regions of moderate summer weather. Can also be grown as a late variety in the more northern States or at high altitudes where cabbage can be successfully planted in summer. Is grown mainly for sauerkraut but also for midseason market. Grown in southern Texas for early shipping.

SEASON

Generally reaches harvest 90 to 95 days after being transplanted in late spring or early summer. In warm regions and seasons develops as early as 85 days, but in cooler or more northern locations may require as many as 100 days.

PLANT

(Pls. 11 and 12)

Very large, typically 4,500 to 5,000 g (10 to 11 pounds); is 28 to 33 cm (11 to 13 inches) in height with a maximum spread of 75 to 85 cm (30 to 34 inches), approximately 2.5 times the height. Under especially favorable conditions a weight of 5,500 to 6,500 g (12 to 14 pounds), height of 37 cm (15 inches), and spread of 95 cm (37 inches) are not uncommon.

LEAVES

Many; typically 18 to 22, but sometimes as many as 25 under conditions especially favorable for vegetative growth or unfavorable for head formation. Constitute 30 to 35 percent of the entire weight of the plant; higher proportions of leaves usually associated with small or poor heads.

Most of the outermost leaves lie slightly above the horizontal, with the lateral halves of leaves standing at a slight angle upward from midrib. The plant as a whole has an open, spreading appearance. Only those outer leaves approaching the head rise at an angle of 45° or more. Little curvature of midribs except in leaves clasping head. Tips of leaves near head stand well above top of head.

Under conditions of close planting, size of plant and spread of leaves are restricted; leaves curve upward, are more cup-shaped about head than when more space is available.

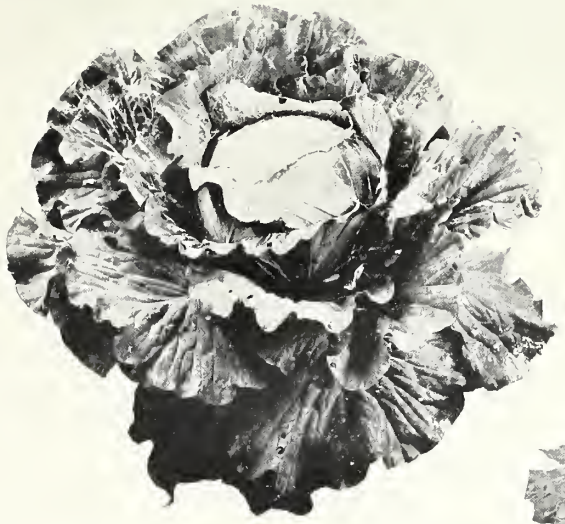
Leaf surfaces slightly undulate; margins of leaves slightly wavy. Leaf edges medium crenate. Bases of outermost leaves distinctly spatulate to petioled, and distal portions broad to rounded. Blades of leaves nearly circular except under western irrigation, where they tend to be elongated and are distinctly petioled. Ribs prominent in thickness, slightly conspicuous; ribs lighter than other parts of leaf (about 19 C 3) and fairly well covered with bloom. Veins prominent. Bloom medium heavy, giving foliage a medium-green color (about 22 A 6) during humid seasons or in humid locations. Under less humid and cool conditions, bloom heavy, giving foliage light gray-green color (about 30 C 4). This latter color is generally the more typical for the variety.

STEM

Medium; 2.5 to 4 cm (1 to 1½ inches) from soil surface to first leaf and 3.2 to 4 cm (1¼ to 1½ inches) in diameter. Outer leaves moderately spaced at attachment to stem, with base of head 2 to 10 cm (¾ to 4 inches) above soil.

HEAD

Oblate but somewhat flattened; large, typically 2,500 to 3,200 g (5½ to 7 pounds) constituting 55 to 65 percent of the total weight of the plant. Under differing environment head size varies widely but should be no less than 2,250 g (5 pounds) nor more than 3,200 g (7 pounds) unless grown for some use as sauerkraut in which large size is not objectionable.



Standard



Acceptable. Leaves rather large



Acceptable



Standard. Growth vigorous



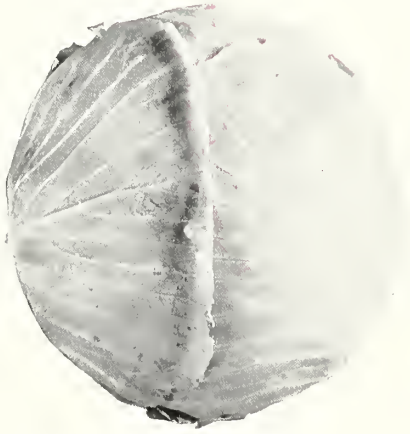
Standard. Growth medium

All Seasons

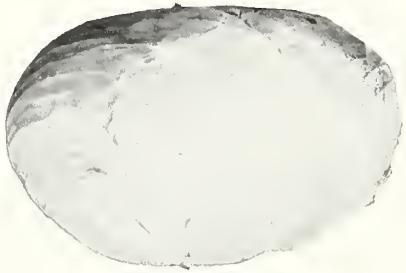
Standard and acceptable types of plant.



Standard



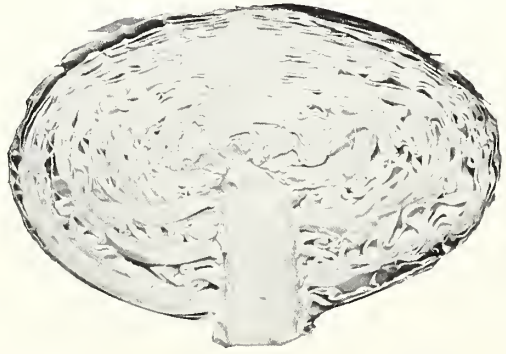
Standard



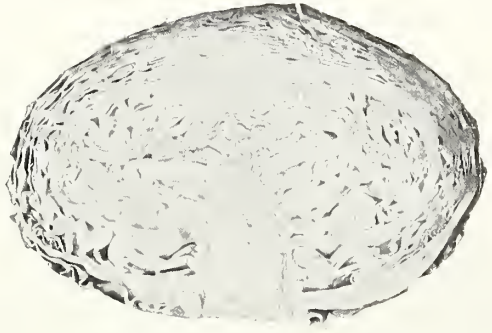
Acceptable, but rather flat on top



Standard



Very desirable compactness, but better than is typical



Acceptable, but rather deep

All Seasons

Standard and acceptable types of head.

Typical heads measure 21 to 24 cm (approximately 8¼ to 9½ inches) in equatorial diameter and 15 to 16.5 cm (6 to 6½ inches) in depth or polar diameter, the depth being 68 to 73 percent of the diameter. Somewhat angular in cross section on account of flattening of sides at the midribs of the outer head leaves. Top and base hard, retaining solidity well when head is cut vertically.

Outer head leaves reach well past center. Midribs medium in height, not conspicuous in color. Other ribs prominent in height but not in color; veins not conspicuous. Bloom light. Head color yellow-green (about 20 J 5) in moderate contrast to leaf color.

Interior head structure appears medium compact. Outer leaves, particularly over top of head, smooth or very slightly crumpled. Interior leaves crumpled but lie fairly closely together forming medium-hard head. Midribs arise from stem or core horizontally or at angle just above the horizontal. Core medium in size, 3 to 4 cm (1¼ to 1½ inches) in diameter and 7.5 to 9 cm (3 to 3½ inches) long, 55 to 65 percent of the length of the head.

Texture medium tender and crisp under favorable conditions. Flavor fair to good but becomes strong in very hot weather.

HISTORY

All Seasons was first listed by J. J. H. Gregory & Son, of Marblehead, Mass., in 1886. Probably the most accurate available information relative to its origin is found in Allen's work.[5] In discussing the confused nomenclature of similar or identical varieties, and by way of illustrating the origin of certain varietal names, that author states:

> Among the number was a Mr. Vandergaw, whose selection was generally known as the Vandergaw cabbage. This particular type was never known to the trade until the writer obtained a stock to grow for seed purposes, for the trade. Its usefulness as a variety for early, intermediate and late planting was soon recognized, and James J. H. Gregory immediately secured the whole stock which he sent out as a novelty, under the name of "All Seasons." The following year W. Atlee Burpee procured seeds from Mr. Vandergaw, without the slightest idea that it was the parent of the "All Seasons," and grew a stock of seed, which he sent out as a "novelty" under the name of "The Vandergaw."

[5] ALLEN, C. L. CABBAGE, CAULIFLOWER, AND ALLIED VEGETABLES, FROM SEED TO HARVEST. 125 p. New York. 1918.

LATE FLAT DUTCH

BRIEF CHARACTERIZATION

Grown for late market, for shipping, and occasionally for sauerkraut.

Late midseason; plant and leaves very large, of open, spreading appearance; leaves numerous, bases spatulate to petioled, blades nearly round, curved upward slightly; leaves near head erect, standing well above top of head; surfaces and margins undulate, edges crenate. Ribs and veins medium conspicuous; bloom heavy, leaf color light gray-green. Stem medium large, internodes medium short.

Head distinctly flat, very large, 6½ to 8 pounds, constituting about 62 percent of total plant weight. Diameter 9½ to 11 inches, depth 6 to 6½ inches, or about 60 percent of the diameter; top of head nearly flat; cross section circular. Head hard; interior leaves in top of head smooth and very compact; in sides of head crumpled and medium compact. Core medium large, length about 63 percent of head.

ADAPTABILITY AND USE

Late Flat Dutch is best adapted to regions of cool summers. It reaches its best development in the States touching the Great Lakes and the Canadian border but is grown much less extensively than certain other varieties. It is grown to a limited extent in the South for shipping, but under those conditions it is usually much smaller than described. The typical size is too great to suit present fresh-cabbage markets, but it is sometimes used for sauerkraut manufacture. It is also grown to limited extent for late market and shipping in the North.

SEASON

Late midseason; generally planted in summer for maturity shortly before frost. In regions of short season may be planted in late spring for late-summer maturity; commonly reaches harvest 100 to 105 days after being transplanted, although this varies considerably because of wide latitude existing in planting and transplanting dates, which even in one locality afford markedly different climatic conditions under which plants make much of their growth. May mature in as few as 90 days or under cool conditions require about 115 days.

Strains listed as Early Flat Dutch are about 10 days to 2 weeks earlier and somewhat smaller than Late Flat Dutch but are otherwise very similar.

PLANT

(Pls. 13 and 14)

Very large; typically 4,500 to 5,500 g (10 to 12 pounds) in weight; 31 to 35 cm (12 to 14 inches) in height, and spreading 80 to 90 cm (32 to 36 inches), approximately 2.5 times the height. In especially favored locations larger plants than described are not uncommon. When grown under unfavorably high temperature, plants are usually smaller than described.

LEAVES

Many, typically 20 to 22, constituting 30 to 35 percent of weight of entire plant. Rarely more than 25 leaves, but under especially favorable conditions for head formation may be as few as 15 to 17 leaves. Very variable in leaf number under different conditions. In hot seasons 30 to 40 leaves may develop, about a third of which will probably die and drop off before harvest, about the same number of leaves as given above persisting.

Outermost leaves stand 15° to 20° above the horizontal, widely spreading and drooping toward the tips; those half way to head about 45° to 60° appearing semierect. Leaves very slightly curved upward or inward along midrib except near end where they curve distinctly outward; broad; across the blade, nearly flat, slightly curved inward.

Leaf surfaces undulate to slightly blistered; margins distinctly undulate; edges crenate, except outermost leaves which are only very slightly so. Bases of outermost leaves narrowly wedge-shaped to petioled, inner leaves wedge-shaped except under western irrigation, where outer leaf bases are very distinctly petioled and inner leaves narrowly wedge-shaped. Distal portions of leaves very broadly rounded.

Ribs thick, medium conspicuous because of light color (about 19 C 3) and height.

Under very dry conditions which are conducive to formation of extra heavy bloom, light rib color is masked somewhat. Veins not prominent in color but conspicuous by depression below ventral surface (upper surface of largest leaves) of blade. Veins in rather prominent relief on dorsal sides of leaves. Bloom medium, leaves medium green (about 22 A 6) in humid regions or seasons; bloom heavy, leaves light gray-green (30 D 4) under less humid conditions. This latter color is more common.



L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc.

Late Flat Dutch, showing typical form and color



Standard



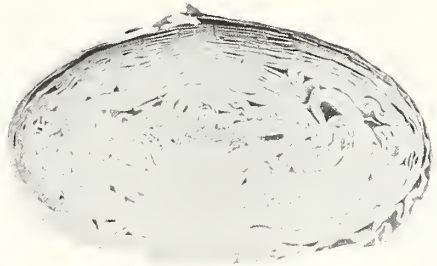
Heavy veins characteristic



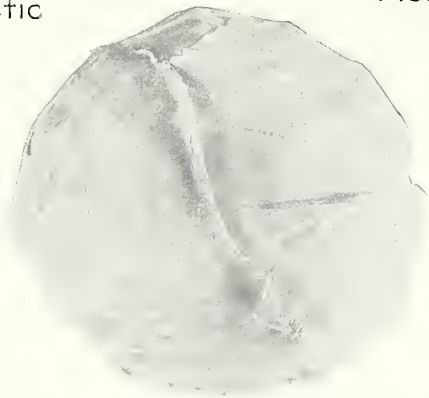
Acceptable



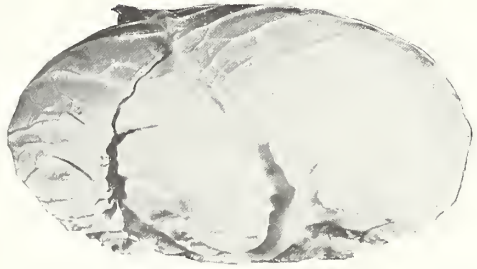
Standard



Standard



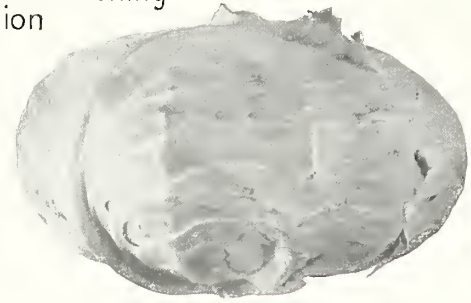
Very desirable, but lacking typical depression in outline



Standard



Acceptable, but lacking compactness



Acceptable, but rather deep

Late Flat Dutch

Standard and acceptable types.

STEM

Medium large; 3.8 to 4.5 cm (1½ to 1¾ inches) in diameter and about the same height except under conditions conducive to dropping many leaves, or under too high temperature when height may be 8 to 9 cm (3 to 3½ inches) to first leaf.

Internodes medium short, leaves compactly spaced at attachment to stem. Base of head typically 7.5 to 10 cm (3 to 4 inches) above soil.

HEAD

Flat; very large, typically 3,000 to 3,600 g (6½ to 8 pounds) constituting 60 to 65 percent of weight of entire plant. Head size varies widely. Weights of 10 to 12 pounds are often attained; although these are considered undesirably large for present markets, are not objectionable for sauerkraut. Typical head measures 24 to 27 cm (9½ to 11 inches) in diameter and 15 to 16.5 cm (6 to 6½ inches) in depth, the depth being 58 to 63 percent of the diameter. Top of head nearly flat[6]. Head round in cross section. Top and base hard, retaining solidity well where head is cut vertically.

[6] In some regions, a deeper, more dome-shaped head similar to All Seasons has been accepted in the past as standard, but this is now generally considered to be erroneous.

Outer leaves reach slightly past center. Midribs medium in height. Other ribs and veins conspicuous in height and light in color. Bloom light. Head color medium green (about 20 J 5) in moderate contrast to leaf color.

Interior head structure appears medium compact. Outer leaves, particularly over top of head, smooth or slightly crumpled. Interior leaves crumpled but lie fairly closely together forming medium hard head. Midribs arise from stem or core at angle just above horizontal. Core medium large, 3.2 to 4 cm (1¼ to 1½ inches) in diameter and 8 to 10 cm (3⅛ to 4 inches) long, 60 to 65 percent of the length of the head.

HISTORY

Our present stocks of Late Flat Dutch are believed to have been derived from an old Dutch variety of the same name. Advice from a seed firm in the Netherlands states that a related firm listed the variety as far back as 1846, beyond which it could not be traced. Another European correspondent is of the opinion that it was derived from the still older German variety, Brunswick, but no definite records of its origin have been noted.

DANISH BALLHEAD

BRIEF CHARACTERIZATION

Grown for late market and shipping, and for storage.

Late; plant and leaves large; of upright, cup-shaped appearance; leaves numerous; base wedge-shaped, rarely spatulate or petioled; blade concave, curved distinctly upward toward head, tip well above top of head. Surface nearly smooth, margins nearly flat, edges slightly crenate. Ribs medium conspicuous, veins not conspicuous. Bloom very heavy, leaf color silver gray. Stem long (this refers to short-stem Danish Ballhead, but a short stem for this variety is long, compared with others); medium large; internodes long.

Head nearly spherical, broadly rounded over the top and slightly elongated toward the base; medium large, 5 to 6 pounds, constituting about 52 percent of the total plant weight. Diameter 7¼ to 8 inches, length 6 to 6¾ inches, or about 85 percent of the diameter; cross section circular. Head very hard, interior very compact. Core medium large, length about 62 percent of head.

ADAPTABILITY AND USE

This variety is suited only to the cool regions of the country, as near the Great Lakes, in States touching the Canadian border, or at high altitudes farther south. It will not thrive in hot weather, and it requires a relatively long season to develop. Grown for late market, shipping, and storage.

SEASON

Late. Generally transplanted in early summer for maturity shortly before frost. In regions of short season, transplanted in late spring for late-summer maturity. Commonly reaches harvest in 105 to 115 days, after being transplanted, although this period varies considerably because of wide latitude existing in planting and transplanting dates, which even in one locality afford markedly different climatic conditions under which plants make much of their growth. May mature in few as 100 days or under cool conditions require as many as 125 days.

PLANT

(Pls. 15 and 16)

Large; typically 4,000 to 5,000 g (9 to 11 pounds) in weight; 30 to 35 cm (12 to 14 inches) tall and spreading 62 to 72 cm (24 to 28 inches), approximately 2.1 times the height.

LEAVES

Many; typically 20 to 22, constituting 33 to 40 percent of the entire weight of the plant. Excessive leafiness objectionable.

Basal halves of outermost leaves horizontal to slightly drooping with distal portions curved slightly upward. Next inner leaves extend horizontally from stem then curve broadly upward at an angle of about 45°, and distal portions curve slightly outward, giving plant an open or loose rosette appearance. Outer leaves nearest head lie close to head up to a level at, or slightly above, greatest diameter, then bend sharply away from head. Most of outer leaves stand well away from head.

Leaf surfaces nearly smooth or flat except for broad curvatures described above; leaves nearly flat across midrib. Margins flat to very slightly undulate; edges of outer leaves entire to slightly crenate, inner leaves slightly to medium crenate. Bases of outer leaves wedge-shaped and inner leaves broadly wedge-shaped except under certain western irrigation conditions and in dry seasons, when outer leaves tend to be narrowly wedge-shaped or petioled and inner leaves wedge-shaped. Distal part of outer leaves rounded and inner leaves broad to broadly rounded.

Ribs of medium size, light in color (about 17 C 3), medium conspicuous, well covered with bloom. Veins not conspicuous, relatively dark in color (19 D 5).

Bloom very heavy, giving plants silver-gray appearance and masking otherwise prominently light-colored ribs. (About 28 F 1 under humid conditions and about 35 D 2 under conditions under which variety is usually grown.)

STEM

Long, 4 to 6 cm (1½ to 2½ inches) from soil to first leaf; (this refers to short-stem Danish Ballhead, but a short stem for this variety is long in comparison with stems of other varieties) and 4 to 4.5 cm (1½ to 1¾ inches) in diameter. Under arid or other conditions which cause dropping of leaves, this variety exhibits much greater apparent stem height than most varieties; often 8 to 9 cm (3 to 3½ inches) to first leaf.

Internodes long, leaves widely spaced at attachment to stem.



Acceptable. Head somewhat lacking in roundness



Standard



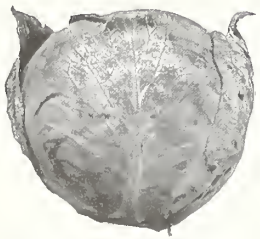
Acceptable. Rather lacking in leaf development



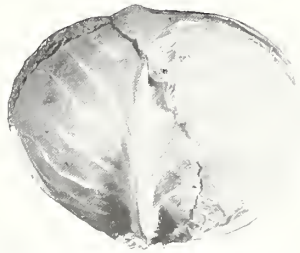
Standard. Growth vigorous



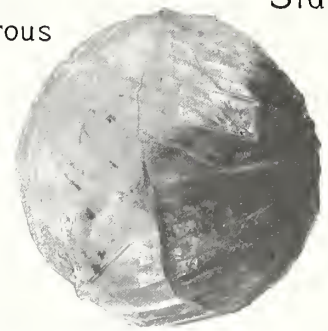
Standard. Growth medium



Standard



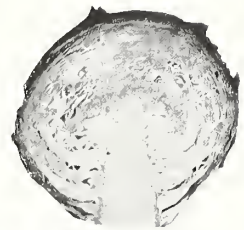
Acceptable, but flattened



Standard



Standard



Acceptable. Rather loose and core long

Danish Ballhead

Standard and acceptable types.



L. C. C. Krieger, Pinx.

Lith. A. Hoen & Co., Inc

Danish Ballhead, showing typical form and color

HEAD

Nearly spherical, medium large, typically 2,200 to 2,800 g (5 to 6 pounds), constituting 50 to 55 percent of the total weight of the plant. Heads weighing 2,800 to 3,500 g (6 to 8 pounds) are sometimes produced, but present markets discriminate against large heads. Head measures 18 to 20 cm (7 to 8 inches) in diameter and 15 to 17 cm (approximately 6 to 6¾ inches) in depth or polar diameter. Depth is 83 to 88 percent of greatest diameter. Head is not spherical (as name might imply) but, in vertical section is easily seen to be broadly rounded over top and slightly elongated toward base, with greatest diameter of head slightly above the center of the polar diameter. Cross section circular. Top and base very hard.

Outermost leaves reach just past the center and lie tightly against underlying leaves. Under drought and high temperature, outermost leaves tend to be shorter, barely reaching the center, or falling short of the center under extreme conditions. Midribs medium in height, not conspicuous with reference to color. Bloom medium heavy (heavier than in most varieties). Resulting color about 21 J 6.

Interior head structure very compact. Leaves composing head smooth and very closely arranged, with very little crumpling except at center of head. Midribs from base of core arise at angle about 30° above horizontal; bases of leaves midway along core arise horizontally or at angle slightly below horizontal, then curve upward very sharply; bases of leaves near top of core, horizontal.

Core medium large; 3.5 to 4.5 cm (1⅜ to 1¾ inches) in diameter and 9 to 10.5 cm (3½ to 4 inches) long, 60 to 65 percent of polar diameter of head.

Texture tender and crisp under favorable conditions. Flavor good as late cabbage but rates lower than the best early sorts.

HISTORY

The variety known as Danish Ballhead in North America is a short-stemmed strain of the old Danish variety Amager, named for the island of Amager near Copenhagen, Denmark. There are also medium- and long-stemmed strains of this variety which are very important in Europe. Strains or varieties of cabbage of the name of Amager are mentioned in Danish records of the fifteenth century, at which time those varieties were reported to have been developed on the island of Amager by Dutch colonists. The firm of Hjalmar Hartmann & Co., of Copenhagen, played a part in the introduction of the Amager strains in the United States. Danish Ballhead was introduced into this country by W. Atlee Burpee & Co., of Philadelphia, Pa., and first listed in 1887.

WISCONSIN HOLLANDER

BRIEF CHARACTERIZATION

Grown for late market and shipping and for storage.

Late; plant and leaves very large and coarse, tall, erect with lower leaves spreading; leaves numerous; lowest leaves distinctly drooping, upper leaves upright; surfaces undulate or crumpled, edges distinctly crenate. Ribs medium conspicuous, veins inconspicuous. Bloom very heavy, leaf color silver gray. Stem long and large, internodes long.

Head deep, broadly rounded over the top and slightly elongated toward the base; medium large, 5 to 6 pounds, constituting about 47 percent of the total plant weight. Diameter 7½ to 8¼ inches, depth 5½ to 6½ inches, or about 77 percent of the diameter. Cross section circular. Head very hard, interior very compact, core medium large diameter, and long; length about 66 percent of head depth.

Is resistant to cabbage yellows.

ADAPTABILITY AND USE

Same as for Danish Ballhead, except that it is resistant to cabbage yellows, which is its only advantage over Danish Ballhead. Because of its greater variability and rougher appearance it is generally less desirable than Danish Ballhead and other late varieties, and should be grown only to replace Danish Ballhead on yellows-infested land. It is grown chiefly in the Middle West.

SEASON

Late. Generally transplanted in early summer for maturity shortly before frost. In regions of short season, transplanted in late spring for late-summer maturity. Commonly reaches harvest in 110 to 120 days after being transplanted, although this period varies considerably because of the wide latitude existing in planting and transplanting dates that even in one locality afford markedly different climatic conditions under which plants make much of their growth. May mature in as few as 100 days or under cool conditions may require as many as 125 days.

PLANT

(Pl. 17)

Very large and tall; typically 4,500 to 5,500 g (10 to 12 pounds) in weight; 33 to 38 cm (13 to 15 inches) tall and spreading 70 to 80 cm (28 to 32 inches), approximately 2.2 times the height.

LEAVES

Many; typically 24 to 28, constituting 38 to 43 percent of weight of entire plant. Leaf number of good strain not extremely variable except under conditions conducive to poor heading.

Basal halves of outermost leaves horizontal to slightly drooping, with distal portions curved slightly upward. Next inner leaves bend abruptly upward at an angle of about 45°, and those near the head are almost erect.

Leaves very large, rather coarse, surfaces undulate or slightly crumpled, margins slightly undulate, edges distinctly crenate. Surface of leaves as a whole very irregular, with consequent lack of distinctive shape and arrangement of all leaves on a plant such as is found in most varieties. Bases of outermost leaves narrowly wedge-shaped, and inner leaves wedge-shaped. In dry seasons or irrigated regions outermost leaves distinctly spatulate at bases, but not petioled. Distal parts of leaves rounded to broad.

Ribs medium conspicuous in height, and color (about 17 C 3). Veins not conspicuous.

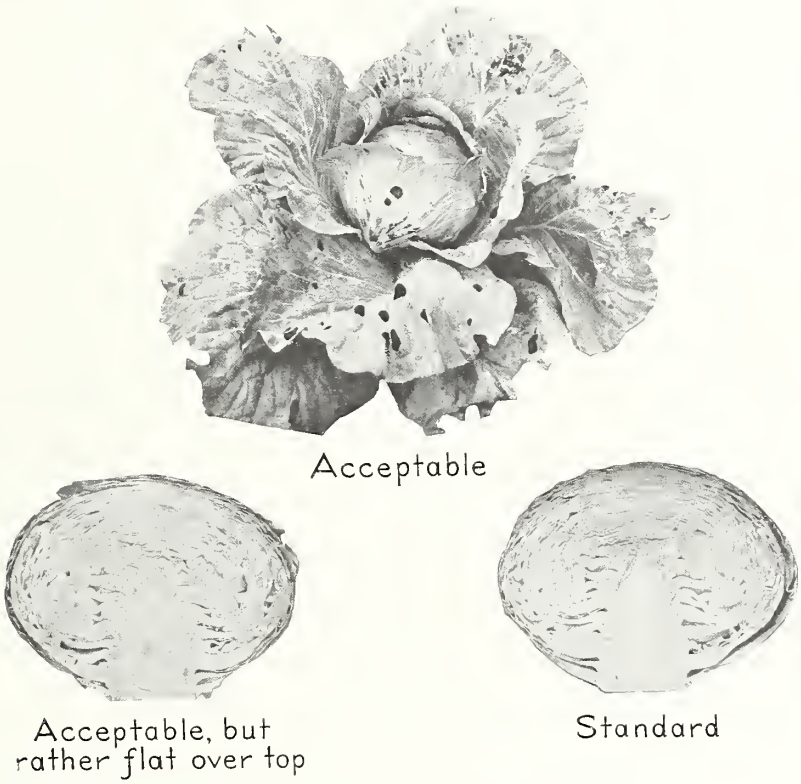
Bloom very heavy, giving plants silver-gray appearance, about 28 F 1 under humid conditions and about 35 D 2 under conditions under which the variety is usually grown.

STEM

Long, large; 5 to 8 cm (2 to 3¼ inches) from soil to first leaf, and 4.5 to 5.5 cm (1¾ to 2¼ inches) in diameter. Under arid or other conditions causing dropping of leaves apparent stem height may be 10 to 12 cm, which is greater than any other common variety. Internodes long, leaves widely spaced at attachment to stem. Base of head 15 to 18 cm (6 to 7 inches) above soil surface.

HEAD

Deep, broadly rounded over the top and slightly elongated toward the base. Medium large; typically 2,200 to 2,800 g (5 to 6 pounds) in weight, constituting 45 to 50 percent of total weight of plant. Measures 19 to 21 cm (7½ to 8¼ inches) in diameter and 14 to 16 cm (5½ to 6¼ inches) in depth. Depth is 75 to 80 percent of the diameter. Cross section circular. Top and base very hard.



Wisconsin Hollander

Standard and acceptable types.

Outermost leaves reach just past center and lie tightly against underlying leaves. Under drought and high temperature, outermost head leaves tend to be shorter, barely reaching center or falling short of center under extreme conditions. Midribs, medium in height, other ribs prominent. Not conspicuous in color. Bloom medium heavy (relatively heavy for head leaves). Resulting color about 21 J 6.

Interior head structure very compact. Leaves composing head smooth and very closely arranged with very little crumpling except at center of head. Midribs from base of core arise at angle about 25° above horizontal; bases of leaves midway along core droop slightly, then curve upward; midribs from near top of core extend horizontally.

Core of medium large diameter, 3.6 to 4.5 cm (1½ to 1¾ inches) and long, 9 to 11 cm (3½ to 4¼ inches); 63 to 68 percent of polar diameter of head.

HISTORY

Wisconsin Hollander originated from two plants selected in 1910 by L. R. Jones and J. C. Gilman, of the Wisconsin Agricultural Experiment Station, from a small number which survived the yellows disease on a badly infested field in Kenosha County, Wis. The original seed used for the planting of this field came from D. M. Ferry & Co., Detroit, Mich., labeled as "Hollander or Danish Ballhead." These two plants were allowed to hybridize in 1911, and the progeny of one of these became the basis of further selection. The progenies of the next (second) generation were tested on infested soil in 1914, when they showed from 2 to 23 percent disease, as compared with 89 percent disease in the mother variety. From the better progenies in these 1914 trials selections were made and seed produced therefrom in 1915. The original introduction was made in the spring of 1916 from the 1915 seed crop by a committee of Wisconsin cabbage growers in cooperation with the Wisconsin Agricultural Experiment Station. Further selection was continued during the succeeding years up through 1919 by L. R. Jones, J. C. Walker, and W. B. Tisdale, of the Wisconsin Agricultural Experiment Station. The variety has been generally listed since 1920.

CHARLESTON WAKEFIELD

The description of this variety is a comparative one, based in part on observations rather than actual measurements as with the others herein described

ADAPTABILITY AND USE

A short-season variety, when small, fairly well adapted to overwintering in the field in the South. Its chief merit lies in the fairly heavy early yields that can be produced when overwintered in the South. It yields more heavily than Early Jersey Wakefield, and overwinters better than Copenhagen Market. Otherwise it has no advantage over these.

Grown in the South Atlantic States for early shipping, for second-early local market, and home garden.

SEASON

Second early. Reaches harvest 75 to 80 days after being transplanted. In warm regions and seasons develops as early as 70 days, and in cool seasons it may require as much as 85 days.

PLANT

(Pl. 18)

Large medium size, tall, spreading, appearing somewhat like Early Jersey Wakefield but much larger (about 50 percent), coarser, and leafier.

LEAVES

Medium in number, typically 13 to 15 but often as many as 17. Large, constituting 50 percent or more of the total plant weight. Leaf habit similar to that of Early Jersey Wakefield but more spreading and leaves lying more closely together.

Leaf surface slightly undulate; ribs and veins light in color, prominent. Bloom medium, giving a lighter color than that of Early Jersey Wakefield. Stem medium-sized and short.

HEAD

Pointed; medium size, typically 1,350 to 1,800 g (3 to 4 pounds), or about 50 to 60 percent larger than Early Jersey Wakefield. Measures 18 to 20 cm (about 7 to 8 inches) long and 15 to 17 cm (about 6 to 6¾ inches) greatest diameter. Approximately circular in cross section. Top bluntly pointed. Moderately firm but not very hard, as usually harvested.

Interior structure appears loose and open. Core medium size, about 50 to 55 percent of head length.

HISTORY

The information concerning the origin of Charleston Wakefield is most conflicting. It is variously reported to be—

(1) The result of a cross between Early Jersey Wakefield and Early Flat Dutch, and this cross has been claimed to have been made at Charleston, S.C., by one grower and at Martins Point, S.C., by other growers. The variety thus reported to have been produced is said to have been turned over to Peter Henderson & Co., of New York, N.Y., in 1880 or 1882.

(2) The result of selection from Early Jersey Wakefield made on Long Island. The stock was reported sold to F. W. Bolgiano, of Washington, D.C., in 1880.

Recent inquiries have confirmed the report that Large Wakefield was listed by F. W. Bolgiano in 1880, but Charleston Wakefield was not listed by Peter Henderson & Co. until 1891. Through the courtesy of these firms, it has been found that their respective records do not show the origin of the variety or varieties first listed under the two names mentioned above. Although it is possible that two very similar varieties were developed more or less simultaneously by independent workers and released to the trade through separate channels, it seems unlikely that two stocks (or varieties) so very similar would have resulted from such widely different methods of procedure as reported. Furthermore, there is little or no indication of any Early Flat Dutch characteristics in Charleston Wakefield, while there are ample evidences of its close relation to Early Jersey Wakefield. The rather primitive state of plant-breeding technic of 50 years ago, the conflicting reports as to where and by whom the cross was made from which Charleston Wakefield was developed, and the 10 or 11 years' lapse between the delivery of the progeny of the cross to Peter Henderson & Co., and that firm's listing of the variety, all together leave some question as to whether the Charleston Wakefield of today is the result of an actual hybridization of Early Jersey Wakefield and Early Flat Dutch. It appears more probable that it is the result of selection from Early Jersey Wakefield.



Standard



Acceptable. Rather coarse



Standard



Standard

Charleston Wakefield

Standard and acceptable types.

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